Remarks/Arguments:

Claims 1-24 were pending in the application. With this amendment, claims 1, 2, 5, 9, 11, 14, 16, 17 and 19 are amended and claims 4, 6, 13, 15, 18, 22 and 24 are canceled. Claims 25 and 26 are newly added. Claims 1-3, 5, 7-12, 14, 16, 17, 19-21, 23, 25 and 26 are therefore pending in the application.

Support for the amendments to independent claims 1 and 9 can be found, for example, in claim 13 as originally filed, claims 22 and 24 as originally filed, and in the Figures. Claims 2, 5, 11, 14, 16 and 17 have been amended to conform to the amendments to claims 1 and 9, from which they depend. Support for new claims 25 and 26 can be found in the originally filed specification, for example, at page 7, lines 13-24 and in the Figures. No new matter has been added.

Claims 1-16 and 18-24 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,560,958 ("Bromberg"). Claim 17 stands rejected under 35 U.S. C. § 103(a) as unpatentable over Bromberg. Applicants respectfully submit that the currently pending claims are patentable over Bromberg for at least the following reasons.

Features of Amended Independent Claims

Applicants' invention, as recited in independent claim 1, includes the following features which are neither disclosed nor suggested by Bromberg, namely:

> intermittently contacting the at least one NO_x sorber with ***a reductant comprising hydrocarbon*** effective to convert NO_x to N_2 thereby to regenerate the at least one NO_x sorber and feeding effluent from said intermittent contacting step to an engine inlet ***and further comprising, during regeneration, injecting the reductant to the exhaust gas at an inlet of the at least one NO_x sorber to convert NO_x to N_2.*** (emphasis added).

In an exemplary embodiment of Applicants' invention as recited in independent claim 1, as shown in Figure 1, the method includes intermittently contacting the at least one NO_x sorber 30A or 30B with a reductant comprising hydrocarbon. Among other steps, the method further includes injecting the reductant to the exhaust gas at an inlet of the at least one NO_x sorber,

during regeneration. As shown in Figure 1, injecting the reductant is provided by the injector 32A or 32B at the inlet of the NO_x sorber 30A or 30B.

Independent claim 9, although not identical to independent claim 1, includes features similar to claim 1.

Response to Rejections

Independent claims 1 and 9 stand rejected as anticipated by Bromberg. Applicants' invention, as recited in independent claim 1, includes a method of treating exhaust gas of a lean-burn reciprocating engine containing NO_x, which method comprises the step of intermittently contacting the at least one NO_x sorber with a reductant comprising hydrocarbon. Further, the method comprises, during regeneration, the step of injecting the reductant to the exhaust gas at an inlet of the at least one NO_x sorber. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicants submit that Bromberg fails to disclose or suggest at least these above noted features.

More specifically, as shown in Figures 1-4, Bromberg illustrates an emission abatement system including a plasma fuel converter 12. The plasma fuel converter 12 receives air, fuel, water, EGR and absorber catalyst exhaust and converts these components into a hydrogen rich gas. (See Bromberg at Figures 1-4). As shown in each of Figures 1 and 2, the hydrogen rich gas 24 is introduced directly into the absorber catalyst 32. As disclosed in Bromberg, "the absorber catalyst 32 is regenerated by the hydrogen rich gas 24 which reduces the NO_x in the absorber catalyst 32 to nitrogen (N_2)." (Bromberg at col. 3, lines 14-16). As shown in Figures 3 and 4, the hydrogen rich gas from the plasma fuel converters is also introduced into each of the absorber catalyst 32 and absorber catalyst 42. Applicants submit that Bromberg's system is distinguishable from Applicants' invention, as recited in independent claims 1 and 9.

In contrast to Bromberg, which includes a plasma fuel converter to provide hydrogen rich gas to its absorbent catalysts, Applicants' invention of claims 1 and 9 requires that the reductant comprise hydrocarbon. Moreover, as set forth in claim 1, during regeneration,

Applicants' invention requires injecting the reductant to the exhaust gas at an inlet of the at least one NO_x sorber. Such features are neither disclosed nor suggested in Bromberg. Although Bromberg's system introduces fuel to its system, as shown in Figure 1, the fuel is first introduced into the plasma fuel converter, i.e. Bromberg fails to disclose a reductant comprising hydrocarbon injected at the inlet of the absorber catalyst. Instead, at the inlet of Bromberg's absorber catalyst, the reductant is introduced as hydrogen rich gas 24. Bromberg thus does not anticipate claim 1.

Similarly, Applicants' claim 9 requires a reductant comprising hydrocarbon and the at least one NO_x sorber associated with injector means for introducing the reductant to the exhaust gas at an inlet of the at least one NO_x sorber during regeneration. Like claim 1, claim 9 is therefore distinguishable from Bromberg, which fails to disclose or suggest such features.

Applicants recognize that Figures 1 and 2 show air and fuel being fed to the absorber catalyst, although no explanation is given in Bromberg as to why the air and fuel is being introduced. Applicants contend that such combination of air and fuel as shown in Bromberg's Figures 1 and 2, indicate to one of ordinary skill in the art that the combination of air and fuel is intended for combustion purposes in the absorber catalyst and that the fuel is not injected, nor intended to be injected, directly to the absorber catalyst for regeneration of the absorber catalyst. The combination of air and fuel fed to the absorber catalyst is provided in such instances as shown in Bromberg for combustion to raise the temperature of the absorber catalyst to increase the rate of the regeneration reaction of the absorber catalyst. In other words, the "air and fuel" shown in Figures 1 and 2 are not serving as a reductant, and Bromberg does suggest otherwise. Rather, the reductant in Bromberg is the hydrogen rich gas from the plasma fuel converter. In fact, Bromberg's application is directed to providing a plasma fuel converter to provide hydrogen-rich gas to overcome the disadvantages of sources other than a plasma fuel converter for providing hydrogen reducing gas. (Bromberg at col. 1, lines 23-32).

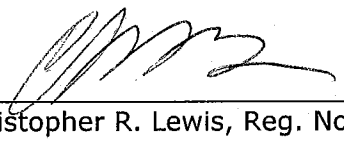
Applicants respectfully submit, therefore, that claims 1 and 9 are patentable over Bromberg. Moreover, claims 2, 3, 5, 7, 8, 10-12, 14, 16, 17, 19-21, 23, 25 and 26 are also patentable for at least the reasons that claims 1 and 9, from which they depend, are

patentable, but may be separately patentable for additional reasons as well. For example, claims 5 and 16 recite that the hydrocarbon is engine fuel. As discussed above, Bromberg discloses its absorber catalyst is regenerated by hydrogen rich gas, not a "reductant comprising hydrocarbon" (as specified in claims 1 and 9), let alone "engine fuel" (as recited in claims 5 and 16). Moreover, newly added claims 25 and 26 specify that at least some of the exhaust gas flow is still maintained across the sorber being regenerated whereas the embodiments of Figures 3 and 4 of Bromberg indicate that exhaust gas does not flow across the absorber being regenerated.

Conclusion

In view of the amendments and arguments set forth above, Applicants submit that the currently pending application is in condition for allowance. Notice to this effect is earnestly solicited.

Respectfully submitted,



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